NARPM 2015 Course Abstracts

Adaptive Management: Applications in EPA-lead Remedial Design and Remedial Action is a quarter-day session designed to assist EPA program managers, RPMs, and technical support staff in understanding EPA's approach to incorporate adaptive management concepts in remedial design (RD) and remedial action (RA) activities at Superfund sites. In particular, this course will focus on implementation of multiple technology remedies (with a focus on in-situ source and groundwater remedies).

By taking this course, participants will achieve the following objectives:

- Gain an understanding of adaptive management concepts and how they apply to RD and RA activities;
- Understand the importance of project delivery planning early in the design process;
- Understand how design deliverables may be scoped throughout the RD/RA process to allow for flexibility in the field during remedial action implementation;
- Understand EPA's RA contracting options to most advantageously deliver multiple technology remedies; and
- Discuss two case studies that highlight multiple technology remedy RD/RA planning and implementation.

This course is recommended for project managers, administrative support staff, and technical support staff of all experience levels, particularly those that have Records of Decision with multiple, in-situ technologies.

Be Prepared: Know What to Say and How to Say It is a full-day advanced spokesperson and media training course for EPA RPMs and other site managers. What you say and how you say it is critical to getting the right information out to your many stakeholders. This intensive course is designed to give RPMs and others the confidence they need to explain their work and to talk about tough issues with a wide range of audiences, including affected community members and government officials, the general public, news media and others.

Participants will learn how to prepare for public meetings and news media encounters and how to communicate effectively—even during an emergency. They will also learn how the news media works and how to effectively incorporate social media approaches into their communications efforts.

This highly interactive course features customized individual scenarios relevant to each participant's programs or projects; one-on-one videotaped sessions with professional interviewers; a group training exercise; and critiques of effective and ineffective videotaped public meeting and interview encounters.

A customized EPA "Be Prepared: Know What to Say and How to Say It" Training Manual will be provided during the workshop, and a copy of the on-camera exercises will be made available to each workshop participant.

NOTE: The course is limited to 15 EPA or other federal or state government agency participants who must commit to attending the workshop at the 2015 NARPM Training Program. Participants will be contacted by email prior to the training program and asked about their spokesperson experience, current or relevant projects or issues, public meeting experience, and any encounters they have had with the news media.

Best Practices for More Effective Characterization and Remedy Implementation is a half-day course that highlights best management and technical practices for improved site characterization and remediation. Today's challenging Superfund environment requires project managers to address the scientific, financial, social and policy aspects of sites. Recent innovations in analytical tools, sampling designs, visualization software and remedy design and implementation require new thinking to effectively integrate these best practices into the Superfund process. This course highlights scientific and policy issues encountered at many Superfund sites, as well as successful strategies employed to manage these issues.

By taking this course, participants will be able to better:

- Conduct comprehensive systematic project planning
- Use and refine conceptual site models
- Optimize the remedial investigation
- Design incremental and discrete sampling approaches to meet risk assessment needs
- Define remedy objectives and performance metrics more effectively
- Increase decision confidence through dynamic sampling strategies and adaptive management of remedies
- Develop and execute completion strategies

The instructional methodology integrates case study examples with lecture material to help project managers identify and apply best practices to meet their site challenges. This session explains the suite of best practices available to project managers and provides examples of how they have been used to improve site characterization and implement protective, cost-effective and targeted remedies. This course is recommended for both new and more experienced RPMs, site managers and technical support personnel.

Climate Change Adaptation at Superfund Cleanup Projects is a half-day course that provides an overview of climate change vulnerability analyses and adaptation at contaminated sites. In some circumstances climate change may result in vulnerabilities in the protectiveness of contaminated site remedies. The course focuses on how such vulnerabilities may be better understood and on the means of achieving increased remedy resilience through adaptation measures. By taking the course, participants will achieve the following learning objectives:

- An understanding of climate change issues and of Federal and EPA directives.
- A grasp of Superfund-specific climate change vulnerabilities and identified adaptation approaches.
- The ability to ask site-specific questions to expose remedy vulnerabilities throughout the Superfund process, and to identify options to increase remedy resilience. The course will focus on stages in the cleanup pipeline that provide opportunities to consider climate change adaptation options.
- An awareness of existing and newly developed resources available to RPMs to consider when addressing climate impacts.
- Insights on technical and project management experiences from RPMs of sites that have been recently affected by major weather events.

The instructional methodology for this course includes lecture, regional case studies and a group exercise. The target audience is all RPMs with general knowledge of the Superfund program.

Considerations for Addressing Emerging Contaminants at Superfund Sites is a quarter-day session that aims to inform RPMs about current Agency efforts to identify emerging contaminants and how this information should be considered when implementing remedies. An emerging contaminant is "a chemical or material characterized by a perceived, potential, or real threat to human health or the environment or by a lack of published health standards." A contaminant may also be considered emerging if a new source or pathway to humans is discovered. Emerging contaminants can be especially difficult to address at contaminated sites because of the lack of reliable analytical methods for detecting and quantifying the extent of contamination, and the lack of toxicological data to assess risk. The session will describe the process for developing analytical methods and sources of toxicity information for emerging contaminants, and highlight a case study of actions taken to address perfluorinated compounds (PFOA/PFOS) in groundwater. The case study showcases many of the challenges associated with addressing emerging contaminants at Superfund sites. This session is recommended for RPMs and other site managers of all experience levels.

***Decision Support System for Matrix Diffusion Modeling*:** The objective of this half-day course is to provide training on the Matrix Diffusion Toolkit (Toolkit), an accessible, easy-to-use, and worthwhile tool for modeling matrix diffusion. Low-permeability (low-k) zones can serve as indirect, low-level sources of contamination to transmissive zones due to matrix diffusion. The potential for matrix diffusion effects can be seen at virtually any site with heterogeneity in the subsurface, DNAPL, or where persistent groundwater contaminant concentrations after source-zone remediation have been observed. To better equip the groundwater community with practical models for evaluating matrix diffusion effects, the Environmental Security Technology Certification Program (ESTCP) funded the development of the Toolkit. The Toolkit provides planning level estimates of the i) mass discharge caused by diffusion from a low-k diffusion-dominated unit into a high permeability advection dominated unit (estimates of concentration and mass remaining in the high permeability unit, after the source is removed, are also provided); ii) contaminant transport via advection and transverse diffusion in the transmissive layer, and iii) transport via transverse diffusion in the low-k zone. Based on the Microsoft Excel platform, the Toolkit is an easy-to-use, comprehensive, free software tool that can assist site personnel in effectively and efficiently estimating what impacts matrix diffusion will have at their site, and communicating the results to stakeholders. Furthermore, the software can assist project managers in determining if remediation goals are achievable in the short-term. Attendees receive training on the Toolkit, as well as a copy of the software, which includes an interactive Help Guide and User's Manual. This course is recommended for RPMs, site managers, and other technical support staff working on sites with groundwater contamination.

Effective Community Involvement for RPMs: Through presentations of case studies and extensive discussions, Effective Community Involvement for RPMs introduces an approach for planning and implementing an effective community involvement program at Superfund sites. Using the framework of a Community Involvement Plan (CIP), participants learn how to develop a proactive approach for meaningfully involving the public through all stages of the Superfund process. During this half-day course, participants will learn how different community involvement tools and techniques can be used to assess and resolve a variety of community involvement situations encountered at Superfund sites.
This course encourages participants to share their own community involvement experiences and current challenges they face at their sites. Collectively, instructors and participants brainstorm possible solutions to challenges presented by course participants.

By taking this course, participants:

- Discuss community involvement challenges and possible solutions with instructors and course participants.
- Identify resources available to RPMs to assist in planning and implementing a community involvement program based on case studies and critical examples.
- Describe various community involvement techniques and approaches that can be used at Superfund sites.
- Explain the elements and function of an outstanding CIP and understand how to sketch out the activities contained within a plan at a typical Superfund site.

This course is recommended for RPMs and other site managers of all experience levels.

Enforcement Focus: Settlement Tools for RPMs is a half day intermediate- to advanced-level course covering unique settlement aspects of the remedial process enforcement program. This course will review in detail several settlement tools that are available and will explain how they work and when they should be considered. After this session, participants will be able to:

- Explain what contribution protection is and "who" it protects from "what," why it provides an incentive for settlement, and how it is incorporated into settlement agreements.
- Describe what comprises a de minimus settlement, when a party is considered to be de minimus, the advantages and disadvantages of using de minimus settlements, and how they are constructed and implemented in an overall enforcement strategy.
- Explain how a party's ability to pay (ATP) is evaluated and determine how ATP should be factored into the settlement strategy for various PRPs.
- Describe the ways that federal PRPs differ from private parties, especially when both may be involved at a site, and how to use settlement tools, such as ATP, when dealing with federal PRPs.
- Explain the value of working closely with your legal team and identify the five most important times to involve your legal team.

The instructional methodology for this course includes lecture, case examples and exercises. The target audience for this course is RPMs with more than three years of experience.

Engineering Forum Case Studies will focus on engineering-based topics of interest to RPMs of all experience levels with time for questions and answers and discussions after the presentations. The panel session will be divided into three parts (30 minutes each), plus 30 minutes of open discussion at the end.

- **Tech Topics Redux** (Michael Gill, EPA ORD Superfund and Technology Liaison, Region 9): The Engineering Forum hosts technical topics on many of its monthly calls. The first talk in this year's session will provide a brief summary of what has been presented since the last NARPM Training Program in June 2014. Mr. Gill will provide a quick overview of the talks and then ask the audience about experience with each of these technologies or processes.
- **Erosion Controls for aboveground cells (**David C. Abshire and Robert Sullivan, EPA Region 6): This presentation is specific to the design and construction of erosion control measures to address surface and outer slope erosion common on many aboveground cells. The presentation will cover the design and construction of the erosion controls on a cell located in East Texas, an area that can receive up to 10 inches per hour of precipitation. The target audience are those who do or may construct and maintain aboveground cells (Consolidation, Subtitle D and Subtitle C Cells). Constructing erosion controls during the initial remedial action is cost effective; returning to the cell post remedial action to address erosion requires additional funds for designs, remobilization, equipment and material, and the prime contractor and subcontractors.
- **Vexing Engineering Challenges**: The Engineering Forum often operates as a sounding board for its members as they request professional judgement on a myriad of topics. Some require a level of technical support that may not warrant a full session or formal request and other issues are just too ominous to put in front of a gathering of colleagues. Now is the chance to start the discussion on these latter problems! The Engineering Forum members were requested to submit at least one vexing engineering challenge that they are confronting in their region. The speaker will provide a couple of minutes of introduction for each challenge, followed by a short period of time to brainstorm possible solutions from the audience. The session will be a chance to get these problems out in the open and also create an informal network of connections for follow-on discussions.
- **30-minute open discussion** (All): Just as it says!

Ensuring You Have Defensible Data is a half-day training course for RPMs, data validators, and other users of analytical laboratory data. The course will focus on the critical elements that must be considered when documenting the quality and usability of analytical laboratory data produced by the analysis of samples from contaminated waste sites and tying that data to the critical decisions that are made by EPA. Critical elements discussed in the course include:

- Quality Assurance Project Plan (QAPP)
- Data Quality Objectives
- Chain-of-custody
- Sample representativeness
- Proper sample collection, storage, and preservation
- Methods and SOPs for preparation and analysis
- Documentation of processes that affect samples
- Documentation of the peer review process
- Quality control and data validation guidelines

Some make assumptions about analytical laboratory data quality, while others leave nothing to chance. The basic process of data review against the Data Quality Objectives is discussed in detail, and several tools that have been developed and are in use by the EPA to enhance and document this process are also presented. The benefits of taking this course include:

- Understanding the importance of planning for the information and data you need (developing your analytical request);
- Understanding the importance of QAPP reviews (that is, why are you collecting the data and how will you use the data for decisions);
- Gaining familiarity with the data elements and the Data Quality Objectives needed to establish required data quality;
- Gaining awareness of available resources to provide guidance in reviewing data, (specifically the National Functional Guidelines);
- Recognizing signs of improper laboratory practices,
- Gaining awareness of data quality tools, including sample management tools such as Scribe, Staged Electronic Data Deliverables (SEDD), performance evaluation samples, and electronic data evaluation software;
- Understanding the importance of documenting data quality through use of qualifiers; and
- Understanding the use of labels to document the level of review applied to data.

Environmental Justice in the Remedy Selection and Design Process**:** This discussion-based, intermediate panel session will focus on addressing environmental justice concerns in the Superfund remedy selection and design process. This session provides participants with a structured dialogue on how RPMs can move toward achieving the goals of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, at Superfund sites. Using a case study framework, small groups will interpret EJSCREEN outputs and discuss how to integrate environmental justice concepts into site activities. By the end of the class, participants should have a better idea on how to identify, set priorities, and act on environmental justice concerns at their Superfund sites.

Evaluation and Remediation of PCB-Contaminated Sites is a half-day session designed to assist EPA program managers, RPMs, and technical support staff in developing PCB remedial designs under the Toxic Substances Control Act (TSCA) risk-based option. This session will also present case studies to support the lecture material.

This course is recommended for RPMs of all experience levels and particularly those RPMs dealing with PCB-contaminated sites. A compendium of key EPA resources for developing PCB cleanup plans will be provided.

PCBs are synthetic organic chemical compounds regulated under the Toxic Substances Control Act, TSCA being a key applicable or relevant and appropriate requirement (ARAR) for PCB Superfund sites. This course will start with TSCA's risk-based approach for PCB remediation waste and move on to the development of cleanup plans to address site-specific conditions.

This session will address sampling strategies, PCBs in groundwater, remediation technologies, and PCBs as a mixed-waste material. One topic discussed will compare TSCA sampling requirements with the need to develop site-specific PCB sampling protocols. The site-specific sampling protocol that will be provided is appropriate for other contaminants, in addition to PCBs. This session will also address the challenges in dealing with PCB migration from contaminated soil to groundwater and dealing with PCBs as a mixed waste, particularly radioactive and ordinance wastes. The selection of the appropriate PCB remediation method will also be covered.

By taking this course, participants will achieve the following objectives:

- Discover how to select the most appropriate PCB sampling protocol.
- Explore how to develop a remediation plan that addresses the migration of PCBs in soil to groundwater.
- Learn about resources for PCB remediation methods used at PCB sites and potential remedies that may be developed.
- Understand issues and options for handling PCBs as a mixed waste.

Evaluating Completion of Groundwater Restoration: A Well-by-Well Analysis is a half-day course designed to assist RPMs, EPA technical support staff, and states in understanding EPA's new guidance for evaluating remedial action completion for groundwater restoration projects.

The training will be based on the:

- "Guidance for Evaluating Completion of Groundwater Restoration Remedial Action," November 2013*;*
- "Recommended Approach for Evaluating Completion of Groundwater Restoration Remedial Actions," August 2014; and
- Groundwater Statistical Tool, August 2014.

This training will assist attendees in understanding groundwater restoration completion expectations and demonstrate how groundwater contaminant well data can be assessed using the Groundwater Statistical Tool. This course includes a mixture of lecture and several case studies demonstrating functions and use of the Groundwater Statistical Tool.

By taking this course, participants will achieve the following objectives:

- Understand EPA's recommendations for determining if a groundwater restoration remedial action is complete;
- Understand recommendations for evaluating concentration levels of contaminants of concern on a well-by-well basis; and
- Through three case studies, be exposed to the groundwater statistical tool and understand how it may be used to evaluate well-specific data.

This course is recommended for RPMs, technical support staff, site managers, state representatives, and other stakeholders of all experience levels.

Everything You Didn't Realize You Needed to Know About Superfund State Contracts**:** This half-day session is designed for all RPMs and state RPMs, either new or seasoned, who want to understand the provisions and management of critically important Superfund State Contracts (SSCs), which must be in place before any Fund-financed remedial actions start. In particular, EPA and state RPMs should attend if they anticipate signing new or amended SSCs, or have Fund-financed remedial action projects approaching financial conclusion.

The session will cover SSC model clauses (and why we need them), and topics including credits, the dispute and claims processes, and remedy enhancement. After attending this session, participants will be able to put in place SSCs that protect both EPA and state interests, and enable fund-financed remedial actions to proceed.

The session will be led by both Headquarters and regional instructors, and includes a lecture component and a group exercise for participants to work through issues they may encounter in the real world of SSC negotiation.

Federal Facilities Update is a half-day session that will provide an update on current initiatives and national issues that affect federal facility cleanup sites. This session focuses on current Federal Facilities Restoration and Reuse Office (FFRRO) and Federal Facilities Enforcement Office (FFEO) issues. The update is divided into three parts:

- Part one features FFRRO, in EPA's Office of Solid Waste and Emergency Response. FFRRO will provide a headquarters perspective on national issues such as munitions, groundwater, and emerging contaminants.
- Part two features FFEO, in EPA's Office of Enforcement and Compliance Assurance. FFEO will provide an update on compliance and enforcement issues in this sector, including recent disputes and penalty actions.
- Part three is reserved for a question and answer period for attendees about issues related to their site cleanup. This period will provide the attendees an opportunity to raise their concerns about the federal facility program and identify issues that are occurring nationally.

The target audience for this session is RPMs working at federal facility sites.

This session is limited to EPA attendees only.

Fine-Tuning Your Spokesperson Skills is a half-day session for participants who are conducting, or who expect to conduct, a public meeting or will be involved with the news media as part of their site. Participants who take this course will obtain:

- A review of key message development and delivery
- A brief discussion of news media pointers, including social media engagement
- On-camera practice delivering key messages
- Strategies to deal effectively with difficult public or news media encounters

Participants will be contacted by email prior to the training program and asked about their spokesperson experience, current or relevant projects or issues, public meeting experience, and any encounters they have had with the news media. A customized EPA "Fine-Tune Your Spokesperson Skills" Training Guide will be provided during the workshop.

In addition, trainers Pam Avery and Dominic Frederico, are available for individual hour-long spokesperson coaching sessions during the training program. Participants can register for one of the slots during the NARPM Training Program registration process.

***Fitting Reuse into the Cleanup Pipeline Session*:** Superfund site reuse opportunities can be explored at any stage in the cleanup process - it is never too late or too early to consider potential reuses for Superfund sites. Consideration of reuse and reasonably anticipated future land uses early in the cleanup process or prior to completing a Record of Decision (ROD) can lay the foundation for future use, and may help streamline remedial actions to dovetail with the intended use of the property. Nevertheless, exploring post-ROD reuse options can also lead to a number of opportunities for beneficial use constructed in a way that is compatible with the site remedy. When considering reuse at Superfund sites, there is no time like the present.

This half-day session will provide an overview of how the EPA has worked with communities to support reuse of Superfund sites during all stages of the Superfund cleanup pipeline. RPMs with extensive experience in reuse activities will discuss various tools, resources and guidance available to support reuse during remedial action objective development, remedy selection, remedy implementation, post-ROD phases and even post construction phases. These tools will be shared in the context of real life Superfund site case studies. Our reuse experts will also discuss the importance of continued use, and ways to support private and public use at sites throughout cleanup.

Opportunities for engaging stakeholders in considering reuse tools to address concerns and issues will be summarized following the case studies. The session will conclude with an in-depth question and answer session in which RPMs are encouraged to share site experiences and lessons learned, and to pose questions to our expert panel.

By participating in the course, participants will achieve the following objectives:

- Discover opportunities for pre-ROD reuse considerations and the benefits these can present for the Agency
- Obtain key take-home messages about the importance of continued site use during cleanup
- Learn about various tools to support reuse during remedy selection and design
- Engage in discussions about reuse possibilities at sites that are construction complete
- Acquire Superfund Reuse Initiative (SRI) tools for promoting reuse at individual sites
- Participate in case study discussions led by a panel of RPMs and project developers who have applied these tools at their sites and can share their experiences and lessons learned
- This session is recommended for RPMs and other site managers of all experience levels.

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Greener Cleanups Go Mainstream is a half-day advanced session on the implementation of greener cleanups and building sustainability into site operations. The course will provide RPMs with an overview of their role in evaluating and implementing Greener Cleanup Best Management Practices (BMPs), highlighting recent developments in policy, practices, and tools. Do not be shy to join us if you are new to greener cleanups - instructors will cover the basics too.

The course agenda includes:

- Introduction and recent developments in greener cleanups
- Overview and application of the ASTM Standard Guide for Greener Cleanups
- Overview of EPA's Environmental Footprint Methodology and the Spreadsheets for Environmental Footprint Analysis (SEFA) and interpretation of footprint analysis results
- Case studies of how your peers are implementing greener cleanups
- Discussion of policy, technical and project management challenges commonly encountered when applying greener cleanup BMPs

The instructional approach for this course includes lecture, case studies, and moderated discussions. The target audience is Fund-lead, PRP-lead, and Federal Facility RPMs who seek to implement greener cleanups and build sustainability into their site operations.

Groundwater Assessments and Five-Year Reviews: This quarter-day session will introduce the upcoming Ground Water Forum (GWF) Issue Paper *Five-Year Reviews of Groundwater Remedies*, which has been developed to assist RPMs in five-year reviews at Superfund sites with contaminated groundwater. The objective of this course and the GWF issue paper is to show how additional planning for five-year reviews can help EPA meet increasing workloads while making the resulting five-year review reports better products that adequately address the long-term effectiveness of groundwater remedies. Presentations will include:

- Examples of the technical considerations and resources available to RPMs and technical staff to ensure that all relevant issues have been identified and considered during the five-year review process.
- Examples and discussions of good five-year reviews for various types of groundwater remedies.
- Current efforts to simplify and improve five-year reviews for groundwater sites as national workloads for five-year reviews increase. This increasing workload is the result of a number of factors: rising expectations about the quality of five-year reviews, the increasing numbers and complexity of sites requiring five-year reviews, and the ongoing decline in RPM and technical staff levels and experience at EPA.

Presentations will be by Ground Water Forum members and Headquarters staff and regional RPMs. The target audience is RPMs and hydrogeologists who work on five-year reviews.

Groundwater High-Resolution Site Characterization (HRSC) is a half-day abbreviated version of the 2-day course that focuses on groundwater characterization and discusses the (1) impacts of subsurface heterogeneity on the investigation and cleanup of groundwater and related media, (2) need for scale-appropriate measurements and adequate data density, and (3) strategies and tools that are available to overcome the impacts of subsurface heterogeneity.

After taking this course, participants will be able to:

- Define and explain the need for and benefits of HRSC at all stages of the project pipeline.
- Discern the sources and attributes of subsurface heterogeneity and their impact on hydrogeology, contaminant fate and transport, and source and plume relationships.
- Define and use scale-appropriate measurements, adequate data density, and collaborative data sets.
- Explain the application of HRSC strategies to the characterization of integrated media, including: groundwater, soil, soil vapor, surface water, sediments and bedrock.
- Identify some of the primary tools for HRSC implementation.
- Highlight the importance of managing and visualizing HRSC data for decision making.

Participants will be armed with HRSC fundamentals that will help them to improve their subsurface investigation approaches and develop more realistic and comprehensive conceptual site models (CSM). CSMs developed based on HRSC strategies and tools decrease site uncertainty, improve the remedy selection process for groundwater remedies, and better enable the evaluation, design and implementation of targeted in situ and ex situ groundwater remedies.

The instructional methodology for this course includes lecture, case study review, and facilitated discussion. The recommended audience for this course includes new and experienced EPA RPMs and technical support staff, and federal, state and tribal project managers involved in groundwater investigation and remediation.

Human Health Risk Assessments: What Do RPMs Need to Know? is a half-day training course that focuses on the human health risk assessment process and the key role that RPMs and OSCs play in the successful development, implementation, and use of risk assessments. This course is structured around the four elements of a human health risk assessment, and participants in this course will achieve the following objectives:

- Data assessment – Collecting appropriate data is a key component of any risk assessment. Presenters will explore state-of-the-art sampling methods and theory and how to ensure that the best and most representative site data are used in your risk assessments.
- Exposure Assessment -- A well-developed exposure assessment, including a detailed conceptual site model, are critical to a successful risk assessment. Presenters will review the essentials of exposure assessment and will discuss the appropriate selection of exposure parameters for use in risk assessments.
- Toxicity Assessment -- Participants will get an overview of toxicology and how to access the most recent toxicological data for determining endpoints of concern and the doses that are potentially hazardous. Participants will understand the difference between a reference dose/reference concentration and a cancer slope factor and how these important toxicity factors are used to calculate risk.
- Risk characterization – Risk characterization integrates information gathered in the first three steps of the risk assessment and includes quantification of site risks. Rick characterization is the basis of decision making at Superfund sites. Presenters will review key elements of risk characterization, including the interpretation of numerical estimates of risk and how those risks should be used for decision making and communicated to the public.
- Case Studies: RPMs and Risk Assessors will provide case studies that highlight current best practices in human health risk assessment.

The instructional methodology for this course includes lecture and case studies. The target audience for this course is RPMs and OSCs with all levels of experience.

IGCEs for RPMs: From Scoping to Funding is a half-day course that focuses on the procedures and resources RPMs can use for preparing independent government cost estimates (IGCE) for remedial program activities. Participants discover the recommended procedures for accomplishing this challenging task. This course provides an overview of current policies and resources for RPMs to use in preparing IGCEs. After the review, participants are challenged by a hands-on exercise to prepare their own IGCEs. At the end of the exercise, participant results are reviewed and the source of the different outcomes is discussed. This course also includes a discussion of the types of IGCEs used in the Superfund program and negotiations and documentation of costs.

This course is recommended for both new and experienced RPMs and others who are responsible for developing IGCEs for remedial program activities. Participants receive 3.5 hours of Contracting Officer Representative (COR) training toward the requirements of the Clinger-Cohen Act.

This course is open to EPA RPMs only.

***In-Situ Chemical Oxidation (ISCO) – Fundamentals, Design Guidelines, and Lessons Learned from Technical Support*:** This 90-minute course will focus on specific ISCO fundamentals, preliminary testing and design considerations, and several brief but illustrative examples of lessons learned at EPA CERCLA and RCRA sites and how to avoid potential costly ISCO mistakes. Rather than skimming over a wide range of process fundamentals, the focus will be on several specific topic areas that can be extended to a broad set of ISCO applications. The instructional methodology for this course will include a presentation of ISCO fundamentals, design considerations and details, and specific lessons learned. The lessons learned are mainly the result of technical support provided to EPA Regional staff regarding ISCO projects, and the result of ISCO deployment at an EPA research site. A brief summary of these topic areas are presented below.

- *Fundamentals.* Overview of oxidant types, chemistry, and oxidant activation methods; oxidant demand testing; delivery methods; monitoring; mass transfer/transport limitations; guidelines on when it is appropriate and inappropriate to use ISCO.
- *Preliminary Testing and Design Considerations.* Bench-scale studies; pilot-scale studies; application of oxidant demand results; oxidant volume; oxidant residuals; injection intervals; displacement of contaminated groundwater; preferential pathways; oxidant delivery.
- *Lessons Learned.* Site characterization (groundwater, soils, and grouting); groundwater sample preservation; pilot scale studies (what useful information can be provided); oxidant loading (concentration and volume); oxidant distribution and assessment of radius of influence (ROI) (what and where to measure); impact on MNA; aquifer clogging; performance evaluation.

Time will be reserved for questions, discussion, and informal exchange of information between course participants and instructors. The target audience for this course is all RPMs, other site managers, and technical support staff.

Incremental-Composite Soil Sampling is a full-day course that focuses on the theory and application of ITRC's Incremental Sampling Methodology (ISM), composite sampling designs, and hybrids of the two, Incremental-Composite Sampling (ICS). ICS hybrid designs are useful to address multiple project goals simultaneously. Because "representativeness" is a key aspect of data quality and ISM/ICS data are demonstrably more representative than most discrete data, it will be shown why ICS data are indeed "better" than non-ICS data. The course will answer questions such as:

- What is the difference between ITRC's ISM and EPA's Incremental-Composite Sampling (ICS) strategies?
- What is the difference between incremental samples and composite samples? Hint: incremental samples are used to obtain an accurate estimate of the average concentration for a decision unit (DU). Composite samples are used to preserve spatial information about concentration levels and trends.
- Is there written EPA guidance for these sampling designs?
- What features must an ISM or ICS design have to qualify as ISM or ICS?
- Can ICS give project risk assessors the data they want, while simultaneously meeting the RPM's own data needs for characterization or remedial design?
- How are background concentrations determined, and how are comparisons to background handled using ICS?
- How do we determine site-specific sample representativeness for soils? In other words, how do we determine what a soil sample is supposed to represent, and how do we make sure representativeness is maintained through sample analysis?
- What really is the "representativeness" of discrete or grab soil samples? What does that mean for my ability to use soil sample results to make site decisions?

The course will use lecture and case studies to answer these important questions. The recommended audience for the course is RPMs and technical support staff who need to plan data collection projects, review soil sampling plans developed by others, and critically review soil data for sampling errors that could cause decision errors.

Innovative Characterization and Remediation Technologies for Metals-Contaminated Soils is a half-day introductory to intermediate training course that is divided into four topics and provides basic and advanced information that RPMs can use when managing sites with metals-contaminated soils. By taking this course, participants will achieve the following objectives:

- **The Basics:** The chemistry, physics, and biology of soils are complex. This portion will focus on how changes in physical soil properties, soil mineralogy and soil chemical properties impact contaminant distribution and fate. This portion of the course will enable RPMs to identify important soil chemical properties for managing a contaminated site.

- **Characterization:** The form of the metal (or species) plays a significant role in its fate and toxicity in the environment. What does speciation and isotope data tell you as part of your characterization? Information gleaned from speciation studies provides an in-situ look at the current chemical form of a metal and can be used to predict the long-term fate of the metal and its potential bioavailability based on known geochemical and biochemical properties. The impact of metal speciation on risk assessment has gained much attention over the past couple of decades and will continue to grow in acceptance as an important part in our understanding of metal bioavailability and remediation. This portion of the course will focus on how to use detailed soil chemistry and spectroscopic techniques to understand the risks of metals in soils.

- **Bioavailability:** Risk associated with ingestion of metal contaminated soils often drives risk assessments for human exposure to metals and metalloids at contaminated sites. Determination of soil metal bioavailability is necessary for reducing uncertainties in risk assessments and accurately establishing remediation levels at contaminated sites. A better understanding of the nature of the chemical and physical interactions of contaminants with soil constituents can increase the scientific, regulatory and public confidence in the use of bioavailability for evaluating remedial actions. ORD is working to define the soil characteristics that influence bioavailability and to develop a prognostic *in vitro* model validated against *in vivo* results. These efforts are driving reduced cleanup costs and limiting volumes of contaminated media through less intrusive remedial options. This portion of the course will demonstrate the utility of incorporating bioavailability assessment into remediation plans.

- **Remediation:** Reducing the toxicity, mobility and bioavailability of contaminants are the goals of remediating contaminated soils. A host of soil amendments can be used to accomplish these goals. New to the amendments is biochar, which can be engineered to address site-specific remediation needs. Once the remediation has been implemented, how do you demonstrate efficacy? Measurement, monitoring and modeling are valuable assessment tools. This portion of the course will focus on soil amendments and includes information on verifying that the remediation goals are being met.

The instructional methodology for this course includes lecture and case studies and is designed for RPMs with all levels of experience.

***Institutional Controls Today*:** Institutional Controls (IC) are non-engineered components of a remedy, including legal mechanisms and communication methods that are used to protect the public and safeguard the remedy. Most Superfund sites require effective ICs to ensure that remedies remain protective. This half-day session will use case studies to examine the use of governmental controls, informational controls such as dig alert, and proprietary controls. The session will end with a national perspective on dealing with uncooperative landowners.

The first case study examines the Del Amo Superfund Site in Los Angeles, California, where the extensive use of governmental controls and a dig alert have enabled the EPA to carefully control exposure at a commercial park where redevelopment occurred prior to remediation. The second case study examines the NL/Taracorp Site in Granite City, Illinois where a variety of ICs have been used to ensure that information can be readily available to various stakeholders regarding residual contamination left in place post-remedy.

Uncooperative landowners has been a key issue nationwide, spurring the need for national guidance. EPA Headquarters will present the draft guidance and use examples from across the country to illustrate approaches used, both successful and unsuccessful. The remaining time will address audience issues and questions regarding ICs, with advice freely given by the moderator and panelists.

Interest Based Negotiation for RPMs is a full-day course designed to provide RPMs and other site managers the skills to effectively deal with the many disputes that arise in managing remedial activities. By taking the course, participants achieve the following objectives:

- Learn the basics of Interest Based Negotiations as presented in the best-selling book, *Getting to Yes*.
- Learn how to discover what you and those you interact with need to successfully negotiate or collaborate and how to maximize your ability to reach an implementable solution.
- Understand ways to decide who to involve in negotiations, what issues the group will be able to negotiate successfully, and when and how to retain a facilitator to assist with difficult discussions.
- Practice important negotiation skills, such as active listening, questioning, and re-framing using case examples derived from more than 20 years of Superfund negotiations.
- Learn about the ways to counter difficult negotiation tactics and the fundamentals of Alternative Dispute Resolution.

The Conflict Prevention and Resolution Center draws on more than 20 years of case studies to illustrate the training. Sites such as Ringwood Mines, Remington Arms, McKin, Borit, and numerous others are used. The target audience for this course is both experienced and newer RPMs. Experienced staff have the opportunity to brush up on negotiation skills and see negotiations from a new vantage point, while newer professionals can build a solid foundation in negotiation practice and skills.

The instructional methodology for this course includes lecture, interactive case studies, and individual and group exercises. This course meets the mandatory inspector training requirements set forth under EPA Order 3500.1 for EPA RPMs. Participants also receive 7 hours of Contracting Officer Representative (COR) training toward the requirements of the Clinger-Cohen Act

Introduction to the Remedial Acquisition Framework: A Change in EPA Superfund's Contracting Strategy is a half day course that focuses on providing the EPA audience with an introduction to the award and administration of the Remedial Acquisition Framework (RAF) contracts.

By taking the course, participants will achieve the following objectives:

- Understand how EPA will procure and deliver remedial services under the RAF. This will include a discussion of the RAF suite of contracts, other EPA contracting options, and use of other Federal Agencies or State contracts;
- Master an understanding of the three suites of RAF contracts including: contract structure, leveraging small business concerns, and statement of work requirements for each contract;
- Understand the execution of task orders under a multiple award contract including an introduction to the fair opportunity procedures for each suite of contracts;
- Understand administrative roles and changes to the roles and responsibilities of EPA contracting officers, project officers, RPMs, and managers under these suites of contracts; and
- Provide a forum for EPA staff to ask questions about the RAF.

This course will include lecture and interaction with the audience by providing ample time for questions and answers.

This course is only open to EPA attendees.

Note to attendees:

- *This course will not go into great detail on RPM requirements for managing RA projects under the RAF. If you are interested in this topic, please register for the course entitled "Managing Remedial Action Projects under the New Remedial Acquisition Framework Contracting Strategy".*

- *Opportunities to leverage other federal agencies, in particular the U.S. Army Corps of Engineers (USACE), will not be covered in detail in this course. If you are interested in what types of internal and contracting resources are available to Superfund though the USACE, please register for the course entitled "USACE Capabilities Discussion".*

Lifecycle Adaptive Site Management and Combined Remedies: The Path Forward for DNAPL and LNAPL Source Zone Treatment: This full-day training course focuses on the challenges RPMs face in assessing and characterizing dense and light nonaqueous phase liquid (DNAPL and LNAPL) source zones at hazardous waste sites across the country. The course focuses on the application of adaptive site management and combined approaches for NAPL sites. The instructors address policy considerations and remedy implementation issues that include:

- How geology rules during all phases of site characterization and remediation.
- Use of combined remedies as a best practice for DNAPL remediation.
- Approaches for multi-component remedial action (RA) strategy evaluation in the feasibility study (FS) process.
- What happens to plumes downgradient during and after source treatment.
- How to utilize adaptive site management, knowing that sources reveal themselves as the remedy progresses.
- Opportunities for the instructors and attendees to participate in an open discussion about lessons learned and sharing experiences related to assessment, characterization, and remediation of DNAPL and LNAPL source zones.

The instructional methodology for this training includes lecture, case studies, and an interactive discussion. The target audience for this course is RPMs who are working on DNAPL and LNAPL sites in the remedial investigation and feasibility study (RI/FS) or RA implementation stage or who are considering active DNAPL and LNAPL source zone treatment for a post-construction completion (PCC) site.

Managing Contracts: Focus on the Invoice is a half-day intermediate training course that will provide detailed information on the role the RPM plays in review, approval, and payment of invoices. By taking the course, RPMs will be able to better meet their responsibilities regarding contractor invoices. The course will cover the following:

- Overview of the role of the invoice in Agency accounting and cost control
- Review of the roles and responsibilities of the CO, PO, RPM, and Research Triangle Park (RTP) for general contracting activities and, specifically, for invoice review, approval or disapproval, and payment or disallowance of payment
- Description of the role and responsibilities of the RPM with regard to invoice review
- Specific EPA guidance to assist the RPM in carrying out delegated responsibilities
- Detailed breakdown and description of each element of the invoice and each cost component in the invoice, from the high level roll-ups and summaries to the detailed breakdowns
- Tips and pointers on how to review an invoice and how to resolve potential discrepancies identified during the review
- An exercise that allows participants to practice reviewing an invoice and identify potential discrepancies
- Facilitated discussion on the challenges RPMs face when they review invoices

The instructional methodology for this course includes lecture, a group exercise, and facilitated discussion. The target audience for this course is RPMs with at least 2 to 3 years of experience in managing work assignments and task orders.

Managing Remedial Action Projects Under the New Remedial Acquisition Framework Contracting Strategy is a quarter-day session designed to assist EPA program managers, RPMs, and technical support staff in understanding the contracting and technical personnel and expertise necessary to manage remedial action projects.

The EPA Superfund remedial program has released its new contracting strategy, titled the *Remedial Acquisition Framework*. This framework fundamentally restructures the way that the remedial program procures services from site investigation to site completion. In particular, the strategy will provide the remedial program with contracts to directly execute remedial actions. This change in contracting strategy will change the role of the EPA program, particularly the RPM, in the management of remedial actions. This course provides an introduction to remedial action management and provides expectations for the activities that must be conducted by the program (internal and external resources) to deliver the full array of remedial action technologies.

By taking this course, participants will achieve the following objectives:

- Understand how EPA may deliver remedial action projects under the new remedial contracts;
- Understand quality assurance and technical oversight requirements for the full array of remedial actions, from in-situ technologies to remedies with heavy construction components;
- Gain an understanding of external and internal resources that the RPM may leverage to provide remedial action management; and
- Discuss two case studies that highlight the activities that need to be conducted by the program during remedial action management.

This course is recommended for RPMs of all experience levels, particularly those RPMs that have an interest in using the RA contracts, when awarded.

Note: *This course is not intended to discuss the Remedial Acquisition Framework in great detail. If you would like to learn more about the Remedial Acquisition Framework, it is encouraged that you attend the "Introduction to the Remedial Acquisition Framework: A Change in EPA Superfund's Contracting Strategy" course also being offered.*

***MNA and MNR of Inorganic and Organic Contaminants in Remedial Action Decisions*:** Monitored Natural Attenuation (MNA) for groundwater and Monitored Natural Recovery (MNR) for sediments are remedial action options that can be selected as the primary remedial action at sites or used in conjunction with other technologies as a polishing step. This organic and inorganic natural attenuation course will first provide an overview of this broad topic followed by a more detailed discussion of some of its newer, less familiar aspects, such as MNA for inorganics in groundwater. MNA and MNR both require strategies to be developed that monitor the progress of natural attenuation processes.

This half-day course examines the use of groundwater MNA and sediment MNR of inorganic and organic contaminants in remedial action decisions. Evaluation of MNR in a sediment cleanup Feasibility Study will also be addressed. The course will address criteria for selecting and incorporating MNA and MNR into a site remedial action strategy, how MNA and MNR can be documented and evaluated for performance, and presents case examples for groundwater and sediments.

After taking the course, participants will have a better understanding of how to select and implement MNA (including for inorganics) in groundwater remediation and MNR in sediment cleanups.

***Negotiation Tactics and Counter-tactics*:** Have you ever worked diligently on a good faith negotiation, meeting, or conversation only to see your problem-solving progress stalled by someone bluffing, stalling, or bullying? There are dozens of games and tactics used by negotiators that can stop negotiation progress in its tracks – but they only work if you do not know how to react.

This course will help you identify harmful tactics and plan counter-tactics that help refocus the negotiation on interests and get things moving again. This half-day course will utilize a mix of engaging lecture, film clips, small group activities, and open discussions.

The target audience for this course is anyone interested in improving their tactical negotiation skills. Examples will be drawn from movies and other video media as well as from the participants directly in class discussions. Trainers are experienced staff from the Conflict Prevention and Resolution Center. This course must be taken with an additional 3.5 hours of negotiation training in order to fulfill EPA Order 3500.1 requirements. Please contact Margaret Ross (*ross.margaret@epa.gov*) for information about additional training and webinars to complete the requirement.

Optimization Can Move My Site to Completion - How Does It Work? is a half-day course that focuses on the optimization review process from an RPM's perspective. The course will provide detail on the review process and the benefits an RPM can expect to derive. Each step of the optimization review will be presented so that RPMs can learn (1) how the process is applied in practical terms, (2) how the process is modified to address site-specific circumstances, and (3) the RPM's role in collaborating with the optimization team to make the review process efficient and beneficial.

In this course, participants will:

- Be briefly reminded of the elements of EPA's *National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion* and its implementation status.
- Examine the optimization review process including activities frequently conducted and practices often used at each stage of the pipeline and common recommendations arising from reviews.
- Gain an understanding of the practical applications and results of performing an optimization review by evaluating case studies in different pipeline stages. RPMs will explore their level of involvement in (1) providing data, (2) coordinating with other stakeholders, and (3) focusing the optimization review through the application at two different case study sites. RPMs will also learn about the benefits derived from the optimization reviews at the case study sites.
- Review site selection tools, optimization review resources, and the post-implementation tracking of recommendations from the perspectives of both the RPM and the optimization review team.

The instructional methodology for this course integrates lecture and case study information and provides opportunities for in-depth discussions to give RPMs a clear sense of the intellectual and time investment required for an optimization review and the benefits of applying the process. This course is recommended for RPMs and other site managers of all levels who are considering an optimization review or who are interested in learning more about the process.

Playing and Learning with Superfund**:** The reuse of Superfund sites for recreational and educational purposes is taking off. This panel will present the varied recreational and educational uses supported by Superfund sites, and cover site-specific examples of how sites have been reused for these purposes. The panel will include outside perspectives on how to work with EPA to move towards recreational and educational reuse, and will conclude with an overview of applicable tools and resources. This will include highlighting existing and new partnerships with organizations that can help implement a community's reuse vision.

By participating in the course, participants will achieve the following objectives:

- Learn about the different types of recreational uses supported by Superfund sites;
- Hear about key concerns and lessons learned from non-EPA perspectives regarding recreational and educational reuse;
- Understand the tools and resources that can support recreational and educational reuse, including an update on EPA partners supporting this cause.

***Porewater Concentrations and Bioavailability: How You Can Measure Them and Why They Influence Contaminated Sediment Remediation*:** Why measure porewater concentrations at my sediment site? How do I and when should I account for bioavailability in risk assessments and remedial decision-making? What are common porewater sampling methods and how do I pick the best one for my site? When should I measure porewater concentrations and when is bulk sediment chemistry or equilibrium partitioning modeling good enough? What are the advantages of using passive sampling for measuring porewater concentrations? How can I use porewater data within the RI/FS, design, implementation, or monitoring phases of the remedial process?

This is a full day course for RPMs of all experience levels and is an updated version of the course presented at the 2014 NARPM Training Program. Hosted jointly by the EPA Contaminated Sediments Forum and the National Institute of Environmental Health Sciences Superfund Research Program, this course will help RPMs understand why, how, and when to measure porewater as part of contaminated sediment assessment and management, and what it tells us about contaminant bioavailability. Instructors will explain the basics of chemical fate, transport, and uptake, with a focus on porewater as a key route of exposure and a strong indicator of bioavailability. Passive sampling devices (PSD) are a promising technology for measuring porewater concentrations and assessing bioavailability, particularly for common sediment contaminants such as PCBs, PAHs, chlorinated pesticides and dioxin-like compounds. PSDs targeting metals are also being developed and will be discussed. The course will also provide a discussion of the logistical and quality control considerations necessary to successfully use PSDs at your site and will present three case studies where porewater measurements were used to understand bioavailability. By taking the course, participants will be better able to:

- Explain why bioavailability is important, how porewater concentrations relate to bioavailability, and when it is important to measure porewater concentrations,
- Evaluate the different methods available for directly measuring porewater concentrations and the advantages and disadvantages relative to PSDs, bulk sediment chemistry, and equilibrium partitioning modeling methods,
- Distinguish between the different types of PSDs, gaining a familiarity for different PSD and which target compounds they are useful for (e.g., PAHs, PCBs, DDTs, dioxins, metals, etc),
- Assess the technical and logistical details of deploying and analyzing PSDs, such as deployment times, effects of temperature, salinity, and biofouling, calibration and validation, quality assurance considerations, analytical techniques, and contract laboratory capabilities,
- Describe the basics of tiered benthic risk assessment calculations, taking into account the partitioning behavior of contaminants in sediments and in PSDs, and apply this information to site decisions related to benthic uptake/toxicity.
- Recognize the benefits of using PSDs and other bioavailability indicators to reduce the uncertainty in risk assessment and gain more confidence in using bioavailability as a line of evidence,
- Identify recently published guidance and technical guidelines (e.g., U.S EPA, scientific literature, SETAC) for using bioavailability in risk calculations and for determining the effectiveness of site remediation, and
- Evaluate how other RPMs have used bioavailability and porewater measurements at their contaminated sediment sites, including practical tips to maximize the utility of porewater measurements. Case studies will also touch on approaches to avoid sampling pitfalls, and anecdotes about engaging your Superfund site stakeholders regarding porewater measurements and bioavailability assessments[1].

The instructional methodology for this course includes lecture, case studies, and group exercises.

[1]Tentative sites: Palos Verdes Shelf, United Heckathorn, and Upper Columbia River.

Post-Construction Completion Considerations for National Priorities List Sites is a half-day course designed to help RPMs understand EPA's roles and responsibilities for remedies in operation and maintenance (O&M). The training is applicable to Potentially Responsible Party-lead (PRP), fund-lead, and federal facility-lead remedies; however, the focus is on fund-lead remedies. The training will be based on the May 2011 *Close Out Procedures Guidance* and the draft *Guidance for Management of Superfund Remedies in Post Construction*. This training will help new RPMs understand policy and regulatory requirements for post-construction completion. More experienced RPMs will learn about the important changes to existing and upcoming guidance that apply to this phase of the remedial process. The course will be a mixture of lecture, interactive discussions, and case studies.

By taking this course, participants will achieve the following objectives:

- Understand EPA and state obligations for fund-lead remedies after they have been constructed;
- Understand documentation requirements for remedies transitioning from remedial action to O&M;
- Understand EPA responsibilities for PRP and federal facility-lead remedies after they have been constructed; and
- Explore optimization and exit completion considerations and tools available for remedies that have long-term remediation objectives (such as groundwater restoration remedies).

Practical Guide to Compliance with Other Environmental Laws is a half-day course, provides a basic history and describes the major provisions of EPA statutes, such as the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Emergency Planning and Community Right-to-Know Act (EPCRA), the Safe Drinking Water Act (SDWA), and the Toxic Substances Control Act (TSCA). Participants learn how statutes and regulations are developed. The course provides an overview of U.S. environmental regulations that have been created to control, manage or modify our activities and the effects of these regulations on the health of human beings and the natural environment.

Additionally, the course covers the history of environmental laws and the origins of EPA. The course will also discuss how a RPM can determine if their sites are in compliance with other environmental laws. This course is of great value to all RPMs who need to understand how environmental statutes, regulations and policies are formulated and implemented.

A Rapid Multi-Scale Approach for Characterizing Groundwater/Surface Water Interactions and Evaluating Impacts of Contaminated Groundwater Discharge: Contaminated groundwater discharging to surface water can adversely impact aquatic life and drinking water quality and can be particularly difficult to characterize and evaluate. Typically, the challenge is to characterize large reaches of rivers or areas of lakes that have small-scale variability in geology, groundwater flow, and contaminant concentrations, in a manner that identifies the preferential and high flux discharge zones. Identifying these zones is critical because these areas are likely to have the most adverse impact on the receptors. The purpose of this full-day workshop is to present a series of site characterization tools and techniques that can be used to locate key groundwater discharge areas for targeted insightful sampling, rather than random and "out-of-context" grid sampling. An approach using multiple techniques will be presented which starts with large-scale reconnaissance methods to quickly assess large areas, followed by progressively smaller-scale techniques (with successively higher sensitivity) to identify locations for detailed sampling.

The presentation will include an overview of groundwater/surface-water interaction processes that occur in the "transition zone" and affect plumes discharging to streams, rivers, ponds, lakes, and to a lesser extent wetlands and tidally-influenced areas. The rapid multi-scale approach investigation technique then will be presented for a steel mill (RCRA) site located where contaminated groundwater is discharging into Lake Michigan. The advantages and disadvantages of each characterization tool will be discussed and the need for targeted high-resolution sampling to understand the complexities of the systems will be explained. Overall, an 8-day field program dramatically improved the understanding of the nature and extent of the contaminants (primarily benzene which was found at concentrations of up to 607,000 µg/L in the porewater beneath the lake and up to 1,030 µg/L in the surface water). The innovative approach was cost-effective, minimized the number of days spent in the field, identified zones of potential increased ecological risk, and indicated the remediation system installed by the site owner was intercepting only half of the plume width.

Additional case studies will be presented that show the complexity of how groundwater plumes discharge into surface waters. For a tetrachloroethene (PCE) groundwater plume that travels from a dry cleaner to a 14-meter wide river, it will be shown how the last 2.5 meters of the flow path through the riverbed deposits change the size, shape, and composition of the plume. In the riverbed deposits, half of the PCE is transformed into cis-1,2-dichlorethene and vinyl chloride. The study underscores the need for sampling porewater within the riverbed and the complex and heterogeneous nature of groundwater discharge and mass fluxes of contaminants to rivers. Studies of chlorinated solvent contaminant plumes discharging to wetlands will also be discussed and the important role that biodegradation and preferential groundwater flow paths can play in resulting surface water concentrations. Examples sites with creosote contamination and tidal influences on the surface water body will also be discussed.

The final part of the presentation will discuss how to incorporate the groundwater/surface water transition zone into the RI/FS process and things to keep in mind when evaluating proposed remedial actions and monitoring their effectiveness. The workshop will also provide the opportunity for participants to ask questions regarding the best approaches for characterizing groundwater/surface water interactions at their own sites.

The following investigation techniques will be presented and participants will have the opportunity to handle and inspect some of the tools in person.

- Low-altitude aerial infrared (IR) thermography surveys to find groundwater seeps and discharges
- Drag probe surveys of water quality along bottom of lakes/rivers to find groundwater discharges
- Shallow depth temperature mapping of lakebed or riverbed deposits to identify groundwater discharge areas
- Mini-piezometers for determining flow direction and sampling water quality
- Seepage meters for water flux measurements
- Pressure transducers to determine vertical hydraulic head gradients and flow directions
- Waterloo Profiler for sampling shallow porewater at sequential depths within riverbed/lake sediments
- Harpoon Sampler for obtaining representative samples of porewater at shallow depths (6 to 12 inches) below the top of the riverbed or lakebed
- Multilevel drivepoint samplers to determine porewater concentrations at different depths over time

- Diffusion samplers for characterizing concentrations of contaminants in porewater and surface water, and at the interface between the two.

This intermediate- to advanced-level course is recommended for RPMs and technical support staff facing groundwater/surface water interface issues at sites.

Remedial Design/Remedial Action (RD/RA) Short Course is a full-day course that provides an overview of EPA activities conducted during the RD and RA phases of the remedial process. The focus of this course is on EPA-lead RD/RA projects. By taking the course, participants will achieve the following objectives:

- Identify steps for implementing and completing an EPA-lead RD/RA project under Superfund;
- Be introduced to the concept of project risk and discuss the applications and considerations of project risk throughout the RD/RA process;
- Identify different procurement options for RD and RA activities and how these strategies impact RD/RA planning and EPA project management functions;
- Review RPM functions and discuss management of contracting, scheduling, budget, and community/state outreach activities during RD/RA activities; and
- Apply concepts discussed in class to an example case study.

This course is intended primarily for RPMs who have two or more years of experience or who currently are or soon will be involved in an RD/RA project.

RPM Case Studies: This interactive half-day course highlights the diverse and technical Superfund sites. RPMs share their experiences, discuss lessons learned and describe the techniques applied at their sites.

Seeing in 3-D: "Put on these Glasses" for Optimized Cleanups is a half-day session that highlights the use of 3D and 4D visualizations at Superfund sites as more than just a “pretty picture,” and demonstrates how it can facilitate information transfer, optimize characterization and remediation efforts, as well as improve stakeholder and community outreach. Recent advancements in 3D visualization and analysis (3DVA) tools have spurred improvements to the utility of conceptual site models in optimizing site characterization and cleanup efforts. Geo-referenced information — including geology, hydrogeology, aquifer characteristics, contaminant concentration and distribution, well screens, sampling points, temporal information, and more — can now be visualized in a single platform. 3DVA tools are used to synthesize and summarize high-density and complex hydrogeologic and chemical information to illustrate site progress and challenges as well as areas of stakeholder consensus and of contention or uncertainty.

By taking this course, participants will be able to do the following:

- Describe how 3DVA maximizes use of existing data that are often buried in a series of reports, text, and tables and offers technical team members and affected communities the opportunity to identify potential data gaps or unique site features that can lead to cleanup and redevelopment challenges.
- Explain how using 3DVA allows technical teams to focus data collection in areas necessary to address stakeholder concerns while optimizing characterization or remediation efforts.
- Evaluate the powerful analytical capabilities of 3DVA including mass and volume calculations, geostatistical analysis, particle tracking, temporal plume dynamics, and other data evaluations.
- Explore the relatively modest investment 3DVA requires when compared with traditional investigation and cleanup costs for most sites.
- Discern the importance of electronic data management and the ease with which existing 3DVA projects can incorporate new data or site information as it becomes available.
- Develop cost estimates and scope of work language to procure these services.
- Evaluate software capabilities and limitations as well as better identify best practices and potential misuse.

The instructional methodology includes lecture, case study review, and facilitated discussion. This course is recommended for new and experienced RPMs and technical support staff, and federal, state, and tribal project managers.

Site Evaluation Tools and Emerging Technologies is a half-day course focusing on innovative tools and technologies available to RPMs through the Office of Research and Development (ORD) and the Office of Superfund Remediation and Technology Innovation (OSRTI). Consistent with EPA’s Cross-Agency Strategies, these support organizations provide in-house expertise, work with outside technology vendors and collaborate with other Federal agencies to develop and deploy new technologies in support of the Superfund remedial and removal programs. Members of ORD and OSRTI’s Environmental Response Team (ERT) will present a combination of lecture material and case studies to introduce various tools and technologies available to RPMs, discuss their applications and limitations, and explain how to identify and request appropriate support services for your site. Topics will include:

- Geophysical tools,
- Estimating groundwater flux to surface water,
- Remote sampling,
- Direct sensing, and
- Real-time monitoring/data visualization.

The target audience for this course is RPMs and other site managers with all levels of experience.

Streamlining of Five Year Reviews is a quarter-day panel and information session for RPMs who have to conduct Five-Year Reviews (FYR) at their sites. The course will be appropriate for both experienced RPMs who have already conducted FYRs at their sites and those who have not yet completed FYRs at their sites. This is applicable for RPMs with all types of sites: PRP-lead, fund-lead and Federal Facilities. This panel session will include a discussion of best practices for writing and developing FYR reports and a basic discussion of FYRs and tips on how to streamline the reports, as well as any proposed changes to FYR report templates. It will also cover tools developed for Federal Facility FYRs, including an executive summary template and training on protectiveness statements.

Superfund Site Data Management is a half-day course that explains the benefits of investing the time and effort to set up a site-specific data management plan. The course will show how this investment will result in less work in the long-term when it comes to justifying decision-making and achieving key milestones in the Superfund process. This course will emphasize how improvements to a site's data management strategy is a critical component for improving success in the Superfund process.

In this age of technology and sophisticated software tools, data for all sites should be organized in such a way to be able to quickly produce visualizations and other useful data products that can support the RPM with decision-making and achievement of Superfund milestones. Data should be managed to lend itself easily to simple and advanced analysis at low costs. Strategic data management allows for the creation of 3D Conceptual Site Model (CSM) visualizations that integrate physical attributes of the site with contaminant data. Efficient data systems also expedite the use of tailored web mapping tools that allow the RPM to move beyond static map and table analyses.

To achieve this new paradigm of interactive data tools, innovative representations of site complexity, and 3D CSMs, the RPMs, and ultimately the regions, need to embrace proactive data management.

The content of this course will help participants be able to:

- Discover key data management principles that will allow for a better flow of information from the field to your project stakeholders.
- Learn about key national data management tools that will allow you to optimize the storage and distribution of your site data. The functionality of informational tools will be discussed so attendees will have a strong understanding of all the capabilities available to them.
- Explore how effective site data management workflows have allowed regions to deliver field data to enterprise GIS platforms in real-time, allowing for live web maps with instantaneous access to all site data.
- Discover how active data management in the field can lead to rapid generation of 3D data visualization, allowing for collaborative on-site decision-making and tailored conceptual site models for your assessment and remediation needs.
- Learn about successful data management implementations at other Superfund sites and how they were able to reduce costs while improving the quality and accessibility of their data.

The instructional methodology for this course includes lecture, case studies, and group exercises. The target audiences for this course are site managers such as RPMs, and site support personnel such as risk assessors, hydrogeologists, and regional GIS coordinators.

USACE Capabilities Discussion is a quarter-day session designed to assist EPA program managers, RPMs, and technical support staff in understanding in-house and procurement support services that the U.S. Army Corps of Engineers (USACE) can provide to the Superfund Program.

The USACE provides support primarily to procure, oversee, and manage contracts for large and complex construction projects. In addition, support is also provided for relocation, remedial investigations/feasibility studies (RI/FS), remedial designs, value engineering, long-term remedial actions, non-time-critical and time-critical removals, five-year reviews, technical support, and oversight of potentially responsible party (PRP)-lead and State-lead remedial activities.

By taking this course, participants will achieve the following objectives:

- Gain an understanding of USACE support through Interagency Assisted Acquisitions to conduct remedial activities including RI/FS, design, and remedial action implementation;
- Understand types of USACE acquisition tools available to EPA for use;
- Gain an understanding of USACE relocation expertise and support; and
- Understand the wide array of in-house technical resources in USACE to support remedial and removal activities at support sites.

This course is recommended for project managers, administrative support staff, and technical support staff of all experience levels.

***What You Need to Know About Vapor Intrusion Short Course*:** This year the training session on vapor intrusion expands to a full-day short course. The course provides Vapor Intrusion 101 fundamentals and what you need to know about how to assess and mitigate vapor intrusion and ensure long-term protectiveness and effectiveness. The course integrates presentations and case studies focusing on the various phases of vapor intrusion investigations and highlighting several issues that RPMs face when managing vapor intrusion sites. The course provides an update on the OSWER Vapor Intrusion Guide and Policy and Vapor Intrusion Resources, and includes a panel discussion on institutional controls (IC), enforcement strategies, and community engagement issues and considerations at vapor intrusion sites.

Presenters will address and highlight the following phases of the process using best practices, case study examples, and identifying lessons learned:

- *Designing a Vapor Intrusion Investigation*: What should an RPM consider when developing, scoping and planning a vapor intrusion investigation? What sampling methods, analysis, and tools are available to the RPM? What lines of evidence should be included and evaluated when reviewing data from investigations?
- *Pre-emptive Mitigation and Presumptive Vapor Intrusion Response Actions*: What are the different considerations and mitigation and remediation alternatives for residential versus non-residential buildings and at redevelopment properties? Are there different considerations at potentially responsible party (PRP)-lead versus Fund-lead sites?
- *Operation and Maintenance (O&M) and Institutional Controls*: What types of ICs and long-term monitoring should be considered for vapor intrusion sites? If the site is a Fund-lead, how does the State Superfund Contract address vapor intrusion?
- *Community Engagement*: Vapor intrusion sites are unique, in that personal living space is sampled. Come learn about and share frequently asked questions about access and other issues and concerns that RPMs and Site teams must address as part of community engagement activities at vapor intrusion sites.

The target audience for this course is new and experienced RPMs and other site managers working on vapor intrusion sites and anyone interested in learning more about approaches to conducting vapor intrusion investigations, implementing interim and long-term mitigation and monitoring, and sharing practical experiences and lessons learned.

What RPMs and Site Managers Really Need to Know about Managing Health and Safety at Hazardous Waste Sites: For field activities conducted at a Superfund remedial site, the development of a comprehensive health and safety plan (HASP) is the first step in planning for and preventing accidents on sites. This full-day course discusses the use of HASPs for accident prevention and uses information from recent site safety audits to focus on examples of health and safety issues and solutions.

The course will help an RPM or Site Manager answer the following questions:

- What are my health and safety responsibilities?
- What are the main pieces of a health and safety plan I should look for during the review?
- What does the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and the Occupational Safety and Health Administration (OSHA) regulations say are my responsibilities and potential liabilities as the RPM and the EPA representative?
- What are my potential personal liabilities as an RPM or Site Manager?
- What process does an RPM follow when an accident occurs at the site?

This course will be presented in the form of lectures and group discussions and hours from this course can be used to meet the 29 CFR1910.120(e)(4) requirements for RPMs and Site Managers.

The course also will include a presentation on liability, provide information on the RPM's authority for site health and safety with supporting resources, and RPM case studies on accidents that occurred at their sites and how they were handled.

The target audience is RPMs and Site Managers responsible for hazardous waste cleanup operations at Superfund sites.

Working with Tribes during Superfund Responses is a half-day course that provides RPMs with the necessary knowledge to work effectively with tribes on CERCLA response actions which take place on tribal lands, or which impact tribal resources. Through the presentation of background information accessible to a wide audience, and through the more in-depth analysis of a site-specific case study, course participants achieve the following objectives:

- Gain a better understanding of tribal cultures, land use perspectives, communications and protocol.
- Review policies regarding coordination and consultation with Tribal governments in the context of Superfund responses with specific focus on the *EPA Policy on Consultation and Coordination with Indian Tribes (2011), EPA Tribal Treaty Framework* and other relevant policies.
- Learn about the Navajo Uranium cleanup activities.
- Review an update on the first tribal-led remedial action at the Catholic 40 site, and remedial actions at other tribal lands (Tar Creek Superfund Site).
- Explore working with tribes at Federal Facilities.
- Learn about EPA funding opportunities for tribes including regional examples.

The instructional methodology for this course includes lectures, case studies and discussion opportunities. The instructors include RPMs, EPA Headquarters staff, and Tribal representatives. The target audience for this course is RPMs who currently work on, or may in the future work on Superfund responses on or near Tribal lands.